within the penis and the absence of a talon and a carrefour. It is unique among the eucalodiid genera for which the anatomy is known by having a long, slender, compressed penial caecum, a large muscular bulbous base on the spermathecal duct, the vas deferens entering the oviduct wall below the prostrate, and the mesocones and ectocones of the central and lateral teeth having large rounded cusps. Unfortunately anatomical information is not available on most other genera within the Holospirinae, and comparisons are not possible at present.

The above anatomical characterization of *Epirobia* is based exclusively on *E. lurida* because of a lack of data on other species. Strebel and Pfeffer (1880) describe and illustrate portions of the reproductive system and the radula recovered from a dried *E. apiostoma* (Pfeiffer). Pilsbry (1903: 60) expresses doubt about the identity of the radula. Strebel and Pfeiffers' description of the reproductive system are very different from that of *E. lurida*, to the extent that doubt about the identity of their material is even more warranted, and comparisons involving *E. apiostoma* cannot be made at this time. It is possible that *Epirobia* is a compound genus based on shell convergences.

LITERATURE CITED

Bartsch, P. 1906. The urocoptid mollusks from the mainland of America in the collection of the United States National Museum. *Proc. U.S. Nat. Mus.* **31:** 109-160; pls. 3-5.

Crosse, H. 1863. Diagnoses d'especes nouvelles. *Journal de Conchyliologie* **11:** 388-389.

1867. Descriptions d'especes nouvelles. *Journal de Conchyliologie* **15:** 195-203; pl. 4, figs. 1, 4; pl. 5, figs. 2-5.

Fischer, P. and H. Crosse 1878. *Mission Scientifique au Mexique et dans L'Amerique Centrale.* Mollusques terrestres et fluviatills. Paris, **1:** 1-702; pls. 1-20.

Pilsbry, H. A. 1903. *Manual of Conchology;* Ser. 2, **15:** 1-323; pls. 1-65 1903a. Mexican land and freshwater mollusks. *Proc. Acad. Nat. Sci. Phila.* **55:** 761-792; pls. 47-54.

1953. Inland Mollusca of northern Mexico. II. *Proc. Acad. Nat. Sci. Phila.* **105** 133-167; pls. 3-10.

Strebel, H. and G. Pfeffer 1880. *Beitrag zur Kenntniss der Fauna Mexikanischer Land — und Süsswasser — Conchylien.* IV. Hamburg. 1-112; pls. 1-15.

Thompson, F. G. 1971. Some Mexican land Snails of the genera *Coelostemma* and *Metastoma* (Urocoptidae). *Bull. Fla. State Mus.* **15:** 267-302.

A NEW SPECIES OF *CALLISTOCHITON* IN THE CARIBBEAN

Antonio J. Ferreira[1]

2060 Clarmar Way
San Jose, California 95128

ABSTRACT

A new species of chiton, Callistochiton portobelensis *Ferreira, sp. nov., is described and figured. Found at Portobelo, Panama (type locality) and off Key West, Florida, it closely resembles* C. elenensis *(Sowerby) from the eastern Pacific.*

In the Caribbean, the genus *Callistochiton* (Carpenter in Dall, 1879) has been thought to be represented by a single species, *Callistochiton shuttleworthianus* Pilsbry, 1893. In February 1975, while on a collecting trip to the Caribbean shores of Panama, I came across several specimens of what subsequent investigation proved to be an undescribed species of *Callistochiton.*

[1] Research Associate, California Academy of Sciences.

Class Polyplacophora de Blainville, 1816
Subclass Neoloricata Bergenhayn, 1955
Family Callistoplacidae Pilsbry, 1893

Callistochiton portobelensis new species

Figs. 1-6

Diagnosis — Chiton small, less than 1 cm long, greenish cream color. Anterior valve with about 12 subdued radial ribs; posterior valve with none or a few obsolete radial ribs. Mucro

FIG. 1. Callistochiton portobelensis *Ferreira, new species.* Paratype. *Portobelo, Panama. 6.7 mm in length.*

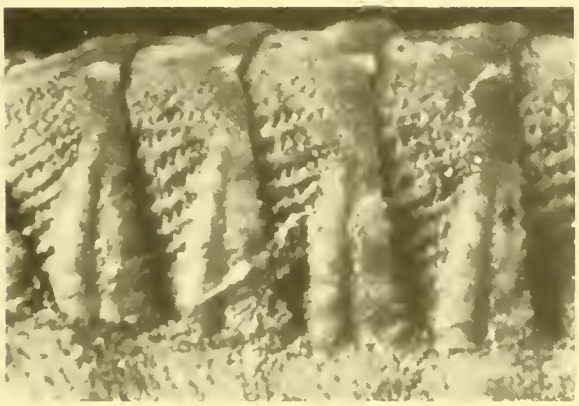

FIG. 2. *Side view of lateral areas of paratype.*

slightly anterior. Lateral areas bicostate, with minute tubercles along the posterior margins. Central areas somewhat diagonally ribbed, and latticed. Jugal area smooth. Girdle scales cylindroid, small, weakly imbricated, outer surface oval and minutely granulose.

Description of the holotype — The specimen, dried but fully extended, measures (including girdle) 6.7 mm in length, 3.6 mm in width, and 1.2 mm in height. Width to length ratio = 0.53. Jugal angle about 96°. Tegmentum of a rather uniform greenish cream color, with occasional small darker green blotches peppering the shell in a random manner; the general surface is microgranular throughout. Anterior valve shows 12 low-profile radial ribs, better defined towards the periphery where they seem more like undulations than ribs on the tegmentum. Posterior valve shows a well defined but not conspicuous mucro, slightly anterior; the post-mucro area is moderately concave, with only the faintest indication of radial ribbing. Intermediate valves have moderately elevated lateral areas bearing 2 broad, slightly granose, low ribs which show no tendency to split; the space between the two radial ribs is well defined but shallow. The posterior of the two ribs in the lateral areas tends to have a few minute, almost obsolete tubercles along its sutural edge. The central areas have longitudinal riblets, about 10 per side, diagonally disposed by diverging forward as a whole at about a 20° angle from the midline; there is no "wedge" figure on valve ii (Ferreira, 1974: 163). The longitudinal riblets are about as wide as the space that separates them, and united by some discrete latticing. The central

FIG. 3. Callistochiton portobelensis *Ferreira, new species. Holotype.* SEM *microphotographs (courtesy of Hans Bertsch) of girdle scales. Approx. 400×.*

FIG. 4. *Girdle scale of holotype. Approx. 500×.*

FIG. 5. *Detail of girdle scale of holotype. Approx. 1500×.*

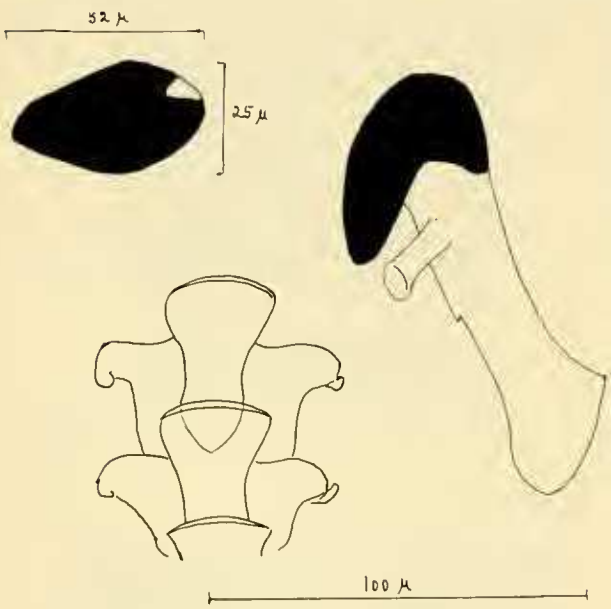

FIG. 6. Callistochiton portobelensis *Ferreira, new species. Holotype. Radula (Camera lucida drawing).*

sculpture becomes obsolete towards the jugal area, which is mostly smooth. The articulamentum is white but, by transparency, shows some occasional small dark blotches. Insertion teeth are straight edged except at the corners where they tend to be a bit thicker and rounded. There is no clear cut festooning or scalloping in any of the teeth. Slit formula 11-1-9. The slits correspond well with the tegmental undulations or ribs. Sutural laminae are sharp, semioval, short, and continue with no visible demarcation or notch with the sinusal lamina. Sinus is relatively shallow. Eaves short and solid. The callus inside valve viii is suffused with dark-brown pigmentation. The girdle has a uniform width of 0.5 mm; it is the same color as the tegmentum but softly banded with green. The scales measure about 80μ in length. They are weakly imbricated, standing close together like cobblestones on a pavement. Somewhat cylindrical in shape, their sides (juxtaposed, and therefore hardly visible in the undisturbed girdle) are neatly ribbed vertically, while its outer (distal) surface, oval in outline, and slightly convex is minutely pustulose. (Figs. 3, 4, 5). The radula measures about 1.6 mm in length, and has 44 rows of teeth. The median plate (tooth) is wider anteriorly (30μ) with a very thin blade, markedly narrowed medially (12μ), and again somewhat dilated posteriorly to terminate rapidly in a blunt point. The intermediate (first lateral) plate has a small superiorly recurved uncinated growth at the outer-anterior corner. The uncinate (second lateral, major lateral) plate has a long and thick (25μ × 8μ) tubercle inwardly directed, and a unicuspid blade, about 52μ long by 25μ wide, with a small posterior notch (Fig. 6).

Type material — Holotype (disarticulated valves, excised fragments of the girdle, and mounted radula) and a paratype (Figs. 1, 2), are deposited with the California Academy of Sciences, Department of Invertebrate Zoology (CASIZ Type Series 679 and 680; CASIZ Type Slide Series 493 and 494). Color slides of some paratypes are deposited with the California Academy of Sciences, Department of Zoology (CASIZ Color Slide Series nos. 3259, 3260, and 3261).

The paratypes vary in size from 5.1 mm to 6.9 mm in length. They all have the same general coloration (with one exception — a uniform brick-red specimen, with faint creamish banding of the girdle), and some irregular, small, greenish blotches. Paratypes deposited with the Los Angeles County Museum of Natural History, United States National Museum of Natural History (USNM no. 710720), Academy of Natural Sciences of Philadelphia, and in my own private collection.

Type locality — 5 km west of Portobelo (latitude 9° 30′ N; longitude 79° 42′ W), Panama. The specimens were all collected on February 15, 1975, by myself, in about 1 to 10 feet of water, under rocks or fragments of old coral resting on sand. They came from two collecting stations (AJF 222, and 223), about 1 km west of Portobelo (1 specimen, 5.5 mm long), and 5 km west of Portobelo (10 specimens, including the here designated holotype), respectively. The species is called *portobelensis* in reference to its type locality, Portobelo.

Further distribution — Another specimen of *Callistochiton portobelensis* was found by the author on April 28, 1975, while diving from aboard the *R/V Coral Reef* with the Steinhart Divers of the California Academy of Sciences, in 5 m of water by the Northwest Channel (latitude 24° 30′ N; longitude 81° 54′ W), off Key West, Florida. The specimen measures 9.0 mm in length. This finding extends the known range of *C. portobelensis* some 1,000 miles northward.

Discussion — *Callistochiton portobelensis* bears little resemblance to *C. shuttleworthianus*, the only member of the genus *Callistochiton* hitherto known in the Caribbean (KAAS, 1972). Instead, in size, color, general shape, sculpture of the tegmentum, and girdle scales, *C. portobelensis* is remarkably similar to *Callistochiton elenensis* (Sowerby, 1832) from the tropical eastern Pacific. Compared with randomly selected specimens from several lots of *C. elenensis* in my collection, *C. portobelensis* was found to differ by 1) its smaller size, 2) a much more subdued sculpturing of the valves, particularly of the radial ribs in valves i and viii, 3) a more rounded and smoother jugal area, 4) no "upswept" valves (see Thorpe in Keen, 1971:875), and 5) thicker longitudinal riblets, separated by narrower interspaces.

Still, the affinities between *C. portobelensis* and *C. elenensis* are so close as to make them sibling species. Likely, they evolved from the same parent population and became geographically isolated by the emergence of the isthmus of Panama in the Pliocene.

ACKNOWLEDGEMENTS

I wish to express my appreciation to Hans Bertsch of the Donner Laboratory, University of California, Berkeley, for the SEM microphotographs; and to the Steinhart Divers of the California Academy of Sciences, and to Beta Research Oceanographic Laboratories, for their assistance in several phases of this work. I wish further to give my thanks to Allyn G. Smith of the Department of Geology of the California Academy of Sciences for his valuable critical comments of the manuscript.

LITERATURE CITED

Ferreira, Antonio J. 1974. The genus *Lepidozona* in the Panamic Province, with the description of two new species. *The Veliger*, 17(2): 162-180, 6 plts. Berkeley, California. October 1.

Kaas, P. 1972. Polyplacophora of the Caribbean Region. *Studies on the Fauna of Curacao and other Caribbean Islands*. vol. 41, no. 137, 162 pp., 247 text figs., 9 plts. Martinus Nijhoff. The Hague. July.

Keen, A. Myra 1971. *Sea Shells of Tropical West America*: Marine Mollusks from Baja California to Peru. 2nd ed. Stanford University Press, xiv + 1064 pp., ca. 4000 figs., 22 color pls. September 1.

A NEW FOSSIL *ASHMUNELLA* (PULMONATA: POLYGYRIDAE) FROM THE GUADALUPE MOUNTAINS NATIONAL PARK, TEXAS

Artie L. Metcalf

Department of Biological Sciences
University of Texas at El Paso
El Paso, Texas 79968

and

Richard W. Fullington

Dallas Museum of Natural History
Fair Park Station
Dallas, Texas 75226

ABSTRACT

A new species of fossil polygyrid land snail, Ashmunella nana, *is described. The species is known only from deposits of Pleistocene age in the southern*